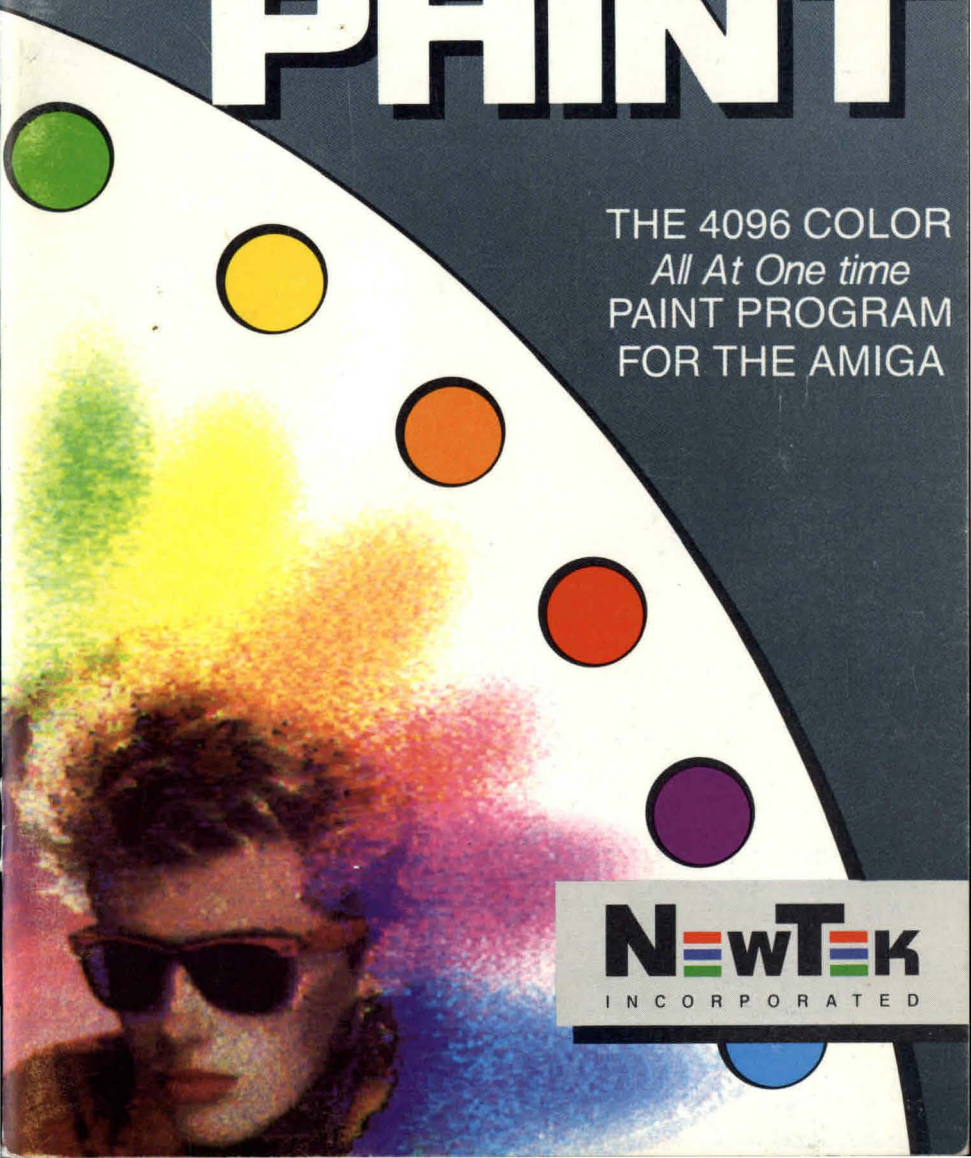


USING

DIGI PAINT



THE 4096 COLOR
All At One time
PAINT PROGRAM
FOR THE AMIGA



NewTek
INCORPORATED

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1986, 1987 by NewTek, Inc., Topeka, Kansas 66603

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Library Catalog Card Number: 86,7-5309
IBMS: 8-9 20-18-9-16
IBMS: 11-9-3-11 1-19-19

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Printed in the United States of America

10 9 8 7 6 5 4 3 2

IBMS 11-9-3-11 1-19-19

NewTek Inc., USA

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PREFACE

The Amiga is one of the most impressive systems to be introduced in the history of personal computing. Never before have so many outstanding features been integrated so elegantly into a “home” computer.

One of the least understood and underestimated features is the Hold-And-Modify video display mode. Initially it was looked upon as something of a curiosity. With the advent of Digi-View, it became apparent that HAM was quite useful in presenting a natural color image, far more lifelike than the easier-to-use 32 color modes.

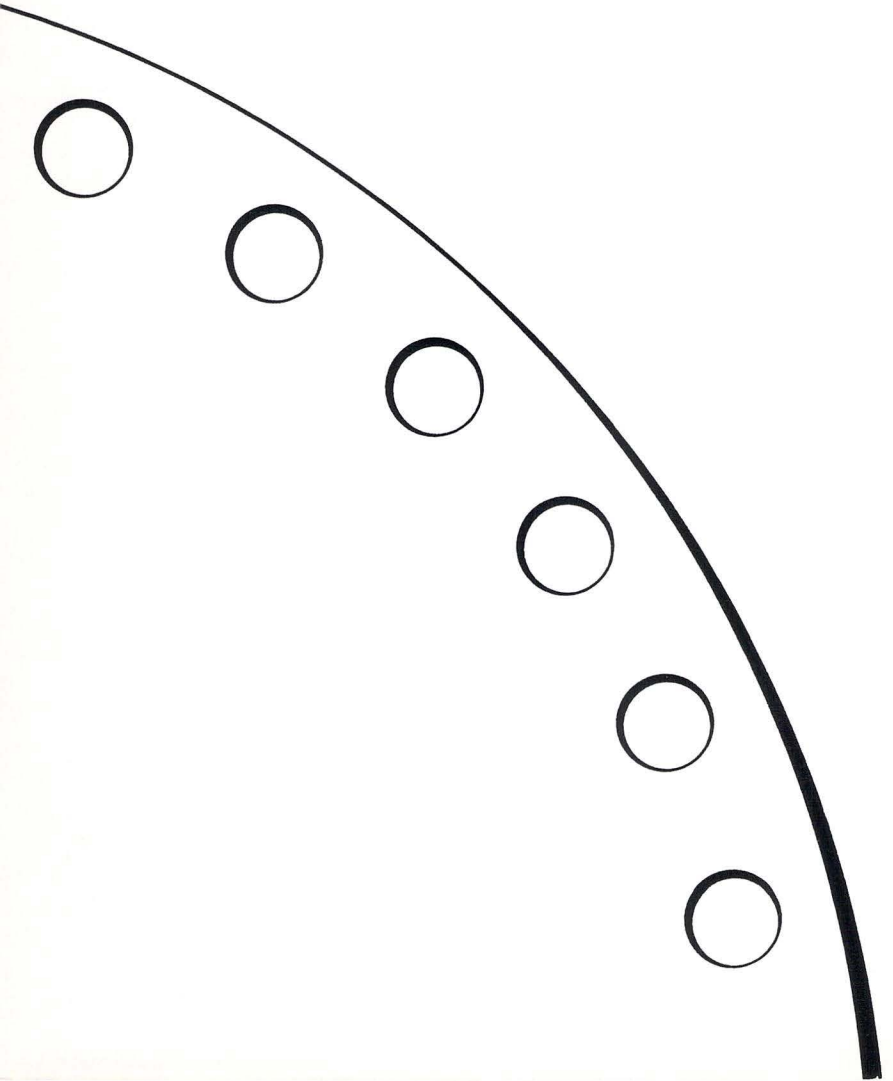
While it can display the entire 4096 color palette at once, the Hold-And-Modify mode presents a formidable challenge to the graphics programmer. In order to plot a pixel of a given color on the screen, all pixels to the left and right must be considered. The algorithms developed at NewTek have overcome the “artifact” problems which have plagued most HAM images. Large numbers of computations must be done in this process, however, and considerable effort has gone into writing these routines in execution-time optimized machine code.

Upon achieving sufficient speed in these core routines, what remained was the task of giving the user powerful tools to take full advantage of the increased color range. Many approaches were tried and discarded. The best ideas ultimately became Digi-Paint. With its varied painting and shading modes, Digi-Paint harnesses the 4096 color palette with unexpected ease. And, the innovative HAM dither routines actually give the effect of a palette much larger than 4096 colors.

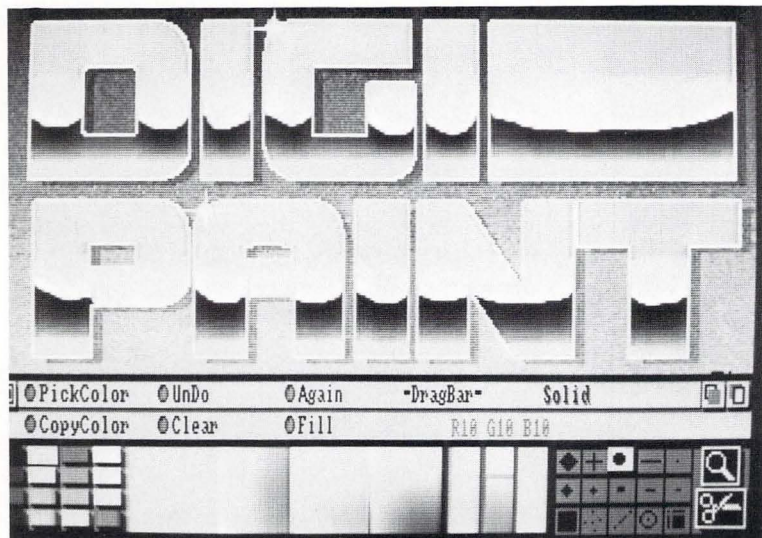
Several man-years went into Digi-Paint’s development. Special thanks go to programmer Jamie Purdon for many months of hard work and patience, Paul Montgomery for moving to Kansas, Sol Peters a constant source of seasoned advice, Kimberly Harris and Jeff Jennings for many late nights, Leslie Jenison, Michele Van Remortel and Bob Downing for understanding, John Song for his helpful suggestions, Dan Silva and the crew at EA for their support, and Jay Miner and his elves for creating the ultimate personal computer.

Tim Jenison
President, NewTek, Inc.

CHAPTER 1



CHAPTER 1 Introduction



What Is Digi-Paint?

Digi-Paint is a software program for electronic painting and image processing that allows you to use the maximum graphics power of your Amiga. With Digi-Paint, you can create, manipulate, and display images in 4096 colors using the Amiga's remarkable display mode called Hold-And-Modify (HAM for short). This special mode allows you to display images with all of the Amiga's 4096 colors onscreen at once. Normally, most programs (such as Electronic Arts' DeluxePaint) allow only 32 colors onscreen at once out of the 4096 colors available. Digi-Paint breaks the "32 color barrier" and can give you all 4096 colors at one time. As in other paint programs, Digi-Paint provides tools to manipulate images by drawing lines, dots, ovals, and rectangles. Digi-Paint also has a number of different ways to shade and tint your pictures, getting the best use out of the thousands of colors now available.

Digi-Paint works in either 320 by 200 resolution or 320 by 400 resolution. Digi-Paint reads standard IFF picture files, so any picture you've created with another graphics program or with Digi-View can be read into Digi-Paint. You can use any part of any painting as a brush and apply it to the screen in any one of 12 different modes for different effects. Digi-Paint's spare screen

allows you to work with two pictures at once and to combine or merge them using different special effects.

Digi-Paint follows standard Amiga conventions regarding use of the mouse: pointing, activating things with the left button, clicking and dragging to draw, accessing menus with the right button. If you're familiar with other Amiga programs, Digi-Paint should be quite easy to use.

How To Use This Manual

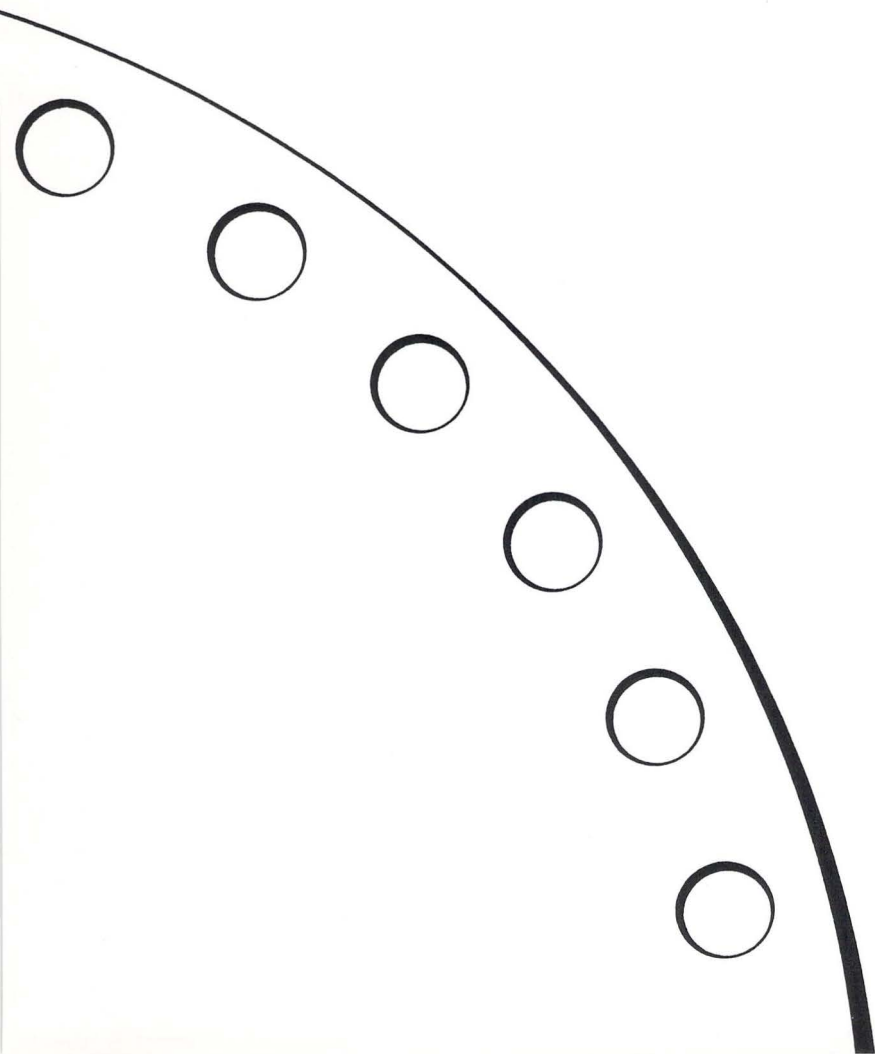
If you are totally unfamiliar with the Amiga, we recommend that you read the Amiga User's Manual before using Digi-Paint. Generally, this manual assumes some familiarity with computers (the Amiga in particular); if you are familiar with the Amiga, you are ready to go.

The manual is organized so you can get started right away. Most people like to ignore the manual as much as possible, because after all you really want to use the software instead of read the manual. If you're a person in the category, no problem. Start the software like you would most other Amiga software and start experimenting. You won't hurt anything. (Before you go on, however, we strongly recommend that you **MAKE A WORKING COPY OF YOUR DIGI-PAINT DISK** and store your original in a safe place). When you have questions, refer to the Reference section of this manual for concise explanations of each feature.

For those of you who want something a little more structured (and can avoid the temptation to throw down the manual and run to use the software), the Digi-Paint manual contains some tutorials to illustrate the use of Digi-Paint, an Applications section that discusses various uses of Digi-Paint, and the aforementioned Reference section where all the features of Digi-Paint are listed and explained.

Everyone should read the Fast Start section for a quick introduction of Digi-Paint and some of the basic features (like loading files). After that, a complete approach would be to read and perform the Tutorials, then read the Applications and the Reference section.

CHAPTER 2

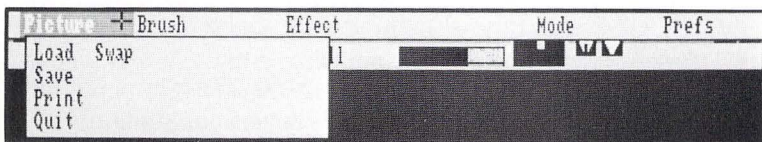


CHAPTER 2 Fast Start

Starting Digi-Paint

Your Digi-Paint software requires an Amiga computer with at least 512K of memory and 1 disk drive. Turn on your Amiga and Load your Workbench. Put your Digi-Paint disk into the second disk drive (or remove your Workbench disk and put the Digi-Paint disk into that drive). Point the pointer at the Digi-Paint disk icon and double-click the left mouse button to “open” the icon. You will see two different Digi-Paint icons — one is labeled “Digi-Paint 320x200” and the other is labeled “Digi-Paint 320x400”. Double-click on the icon labeled “320x200” to start up Digi-Paint.

There will be a brief pause and then a black screen will appear with the “toolbox” down at the bottom. The Toolbox is where you’ll find the Color Palettes, the built-in brushes, and (when you hold down the right mouse button) the four menus (Picture, Brush, Effects, and Mode) where other features are available.



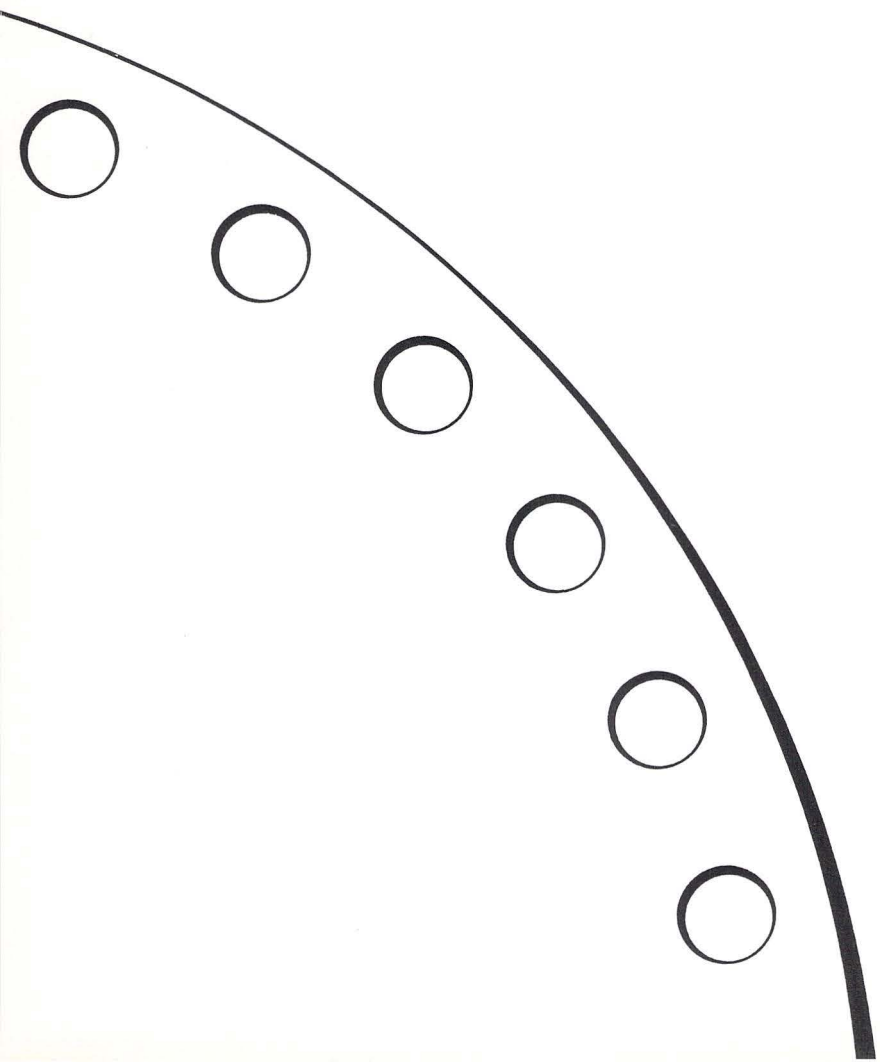
To Load a Picture, hold down the right mouse button and point at the word Picture; the Picture menu will “pull down” and you’ll see the words Load, Save, Print, Quit, and Swap. While holding down the mouse button, move the pointer down until Load is highlighted, then release the mouse button. The Load Requester window will appear. Point to the disk drive name (in the upper left corner of the window) where your Digi-Paint disk is located (usually in Df1: or Df0:; the Dh0: refers to a hard disk drive, you have one). Click with the left mouse button, and the drive will whirl for a moment and the files and drawers available on the disk will appear. File drawers appear in white letters; picture files appear in gray letters. Open up the drawer labeled Pictures by clicking on it with the left mouse button. The disk drive will whirl and you’ll see a list of the pictures included with Digi-Paint. Select any picture by clicking on it with the left mouse button (the name will appear in the box at the top of the Load Requester) and then click the left mouse button while pointing at the Open File button in the upper right corner of the Load Requester. A small requester will appear in the upper left corner of the Toolbox asking you to choose the color palette you

want to use on the display. Click on either button with the left mouse button to make your selection. If you choose "From File", Digi-Paint will ignore the palette already in use on the screen and replace it with the palette saved with the file. If you choose "Existing", Digi-Paint will use the palette that you already have onscreen to display your picture. the picture will load in from the disk, causing the Toolbox to disappear. If you want to bring back the Toolbox, just click the right mouse button. (You can close the Toolbox by clicking with the left button on the tiny box in the upper left corner of the Toolbox.)

Now that you've loaded a picture, you can experiment with the drawing features of Digi-Paint. Move the pointer to the Brush box in the lower right hand corner of the screen. Select different brushes by clicking on them with the left button. Select different colors from the palette in the lower left corner by clicking on the colors with the left button. Now draw on the screen by holding down the left button and moving the mouse. You'll notice that as you draw, some "fringe" colors may appear; when you release the mouse button, the "WAIT" sign will replace the pointer and those fringes will be erased. This is because Digi-Paint uses the HAM display mode of the Amiga, and this display mode places certain constraints on the colors that appear on the screen (see Appendix A for a discussion of HAM mode and Digi-Paint).

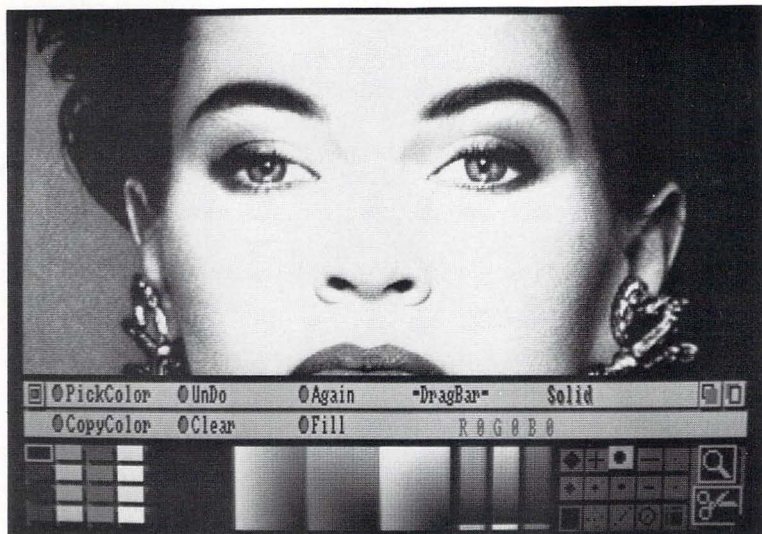
You'll notice as you experiment that the magnifying glass in the lower right corner will zoom into any portion of the screen to show a closeup view of the picture. You can move around with the arrow keys to other portions of the magnified picture. The original picture shows in a window in the upper left portion of the screen. From here on, we suggest you work through the Tutorials, then read the Applications section for some ideas on how to use Digi-Paint. Before you go on, however, we strongly recommend that you **MAKE A WORKING COPY OF YOUR DIGI-PAINT DISK** and store your original in a safe place. After this point, you should never use your original Digi-Paint disk again except to make another working copy in case your first working copy is damaged somehow.

CHAPTER 3



CHAPTER 3 Tutorials

These short tutorials will help you learn how to use the features of Digi-Paint in a practical way. Refer to the Reference section for more detailed explanations of the features demonstrated.



Tutorial 1: Colorizing

This tutorial shows how Digi-Paint can be used to colorize a black and white picture. If you haven't already done so, start up your Amiga and load Digi-Paint interlace (320x400) as described in the Fast Start section of this manual. Now go to the Picture menu and select Load. When the Load requester appears, click on the drive name where your Digi-Paint disk is located. Then click on the Pictures drawer. Inside that drawer you will find a picture titled "Lady". Double-click on that picture to load it into Digi-View. (Use the palette "From File" when the requester appears.)

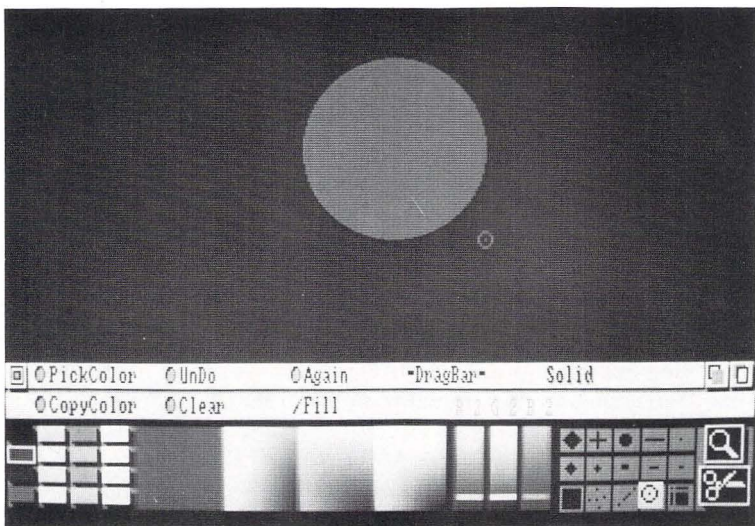
This picture was digitized with Digi-View in black & white. Now we'll use Digi-Paint to provide some lifelike colors for the picture. Select the one-pixel brush (the fifth brush to the right in the top row) by clicking on its icon in the right corner of the Toolbox. Now move to the RGB sliders just left of the Brushes & Tools area where you found the one-pixel brush. Move the Red slider to R3, the Green slider to 1, and the Blue slider to 0. The result should be a very dark brown color in the rectangle to the left of the Color

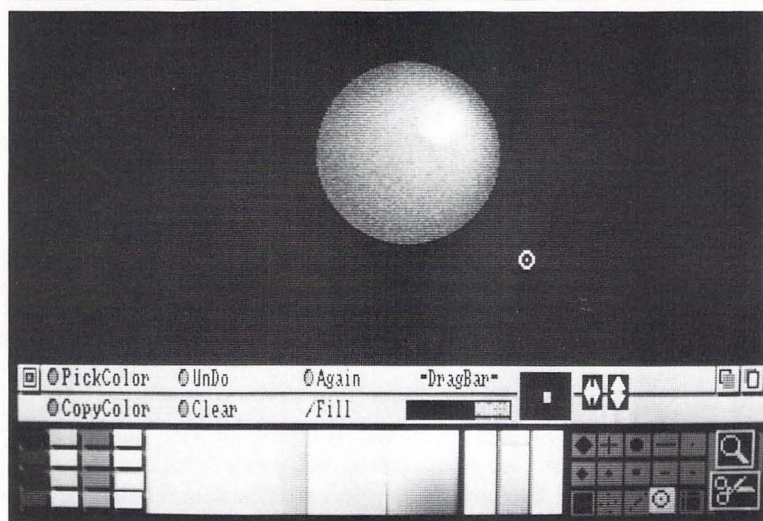
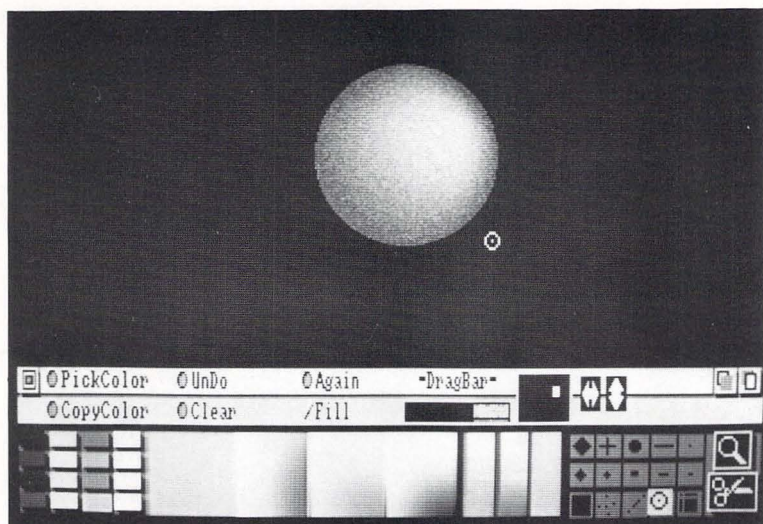
Menus. Now turn on the Fill button by clicking on it. Go to the Mode Menu and select "Add" (a check mark should appear next to it when you look at the Mode menu again). Now go up to the picture and trace the outline of her face by holding down the left mouse button. Be sure you complete the outline so the color fills in properly. When you've completed the outline, release the mouse button and you'll see the flesh tone added to her skin. If you didn't outline the face properly, click Undo and try again.

Now to add color to the lips. Put the Red slider to 3 or 4 and set the Green and Blue sliders to 0. Now trace the outline of the lips and watch the color fill in. If you don't like that shade of lipstick, click Undo and try another color. To add eye color, select a blue color from the Color Menu and use the Tint feature from the Mode menu. use "Shading" to add eyeshadow in a similar manner. Using "Minimum" with a yellow tone to outline the earrings will create a gold effect. Try these different tints on each eye now that you know the technique.

Tutorial 2: The Sphere

To draw a sphere with Digi-Paint quickly and effectively, start with a pure black screen. (If you just did the Colorizing Tutorial, select black on the Color Palette and then click on Clear.) Set the Red slider to about halfway up, and set the Green and Blue sliders to 0. Now select the Oval tool from the Tools area (fourth icon to





the right, bottom row) and turn on fill and then draw a circle on the screen by holding down the left mouse button, dragging the oval out to about two inches in diameter, then releasing the button. Now set the Red slider all the way up. Select Shading from the Mode menu. Turn the Dither control all the way up. Move the Shading Control dot in the middle of the Shading Control box to the upper right hand corner of the box (almost, but not quite in the corner). Now click

the Again button and watch as a sphere appears.

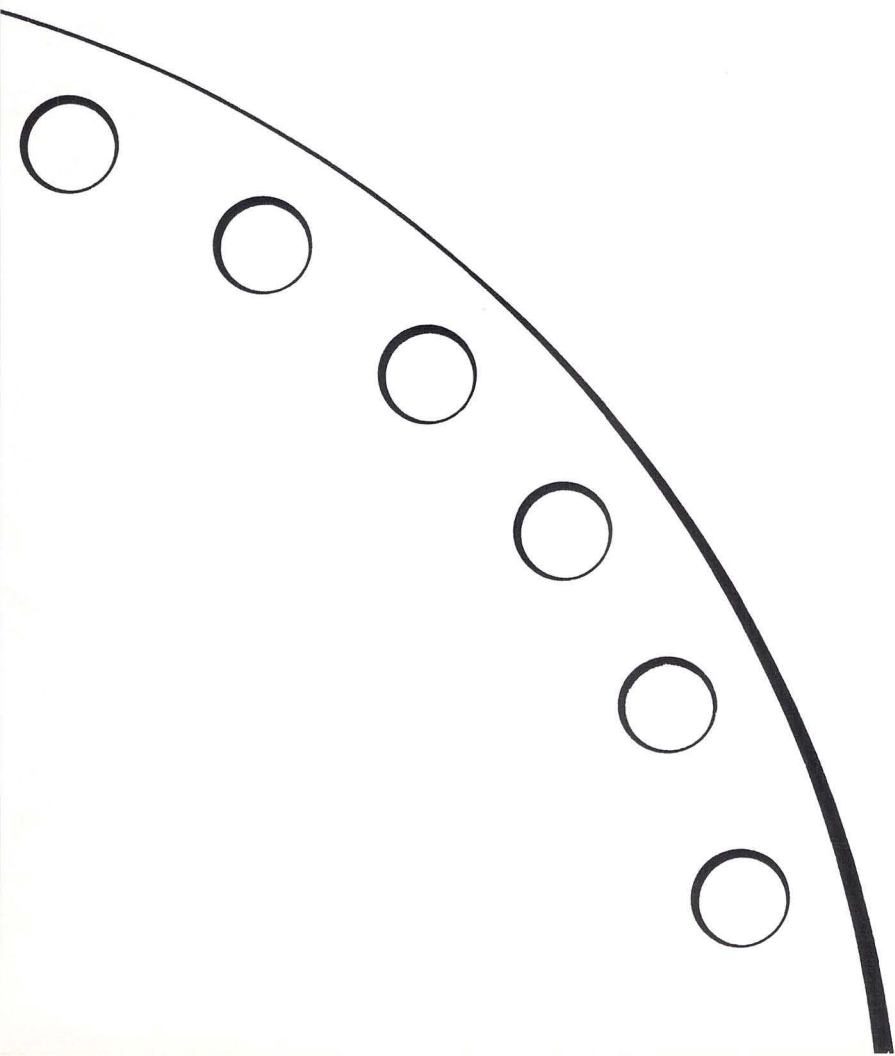
Don't go away — it's time to add a little more realism to your sphere. Pick a color from the Color Menu that's very white, perhaps somewhat pink. (You can do this by clicking with the left mouse button in the color you want in the Color Menu, or by using the RGB sliders.) Move the shading control dot to the center of the shading control box. Now use the Oval tool to create a small oval in the upper right corner of the sphere. The result is a shaded area of very light pink, adding a highlight to increase the illusion of three dimensions.

Tutorial 3: The Third Eye



Load the picture called “Lauren” from the Digi-Paint disk. use the Palette from the file. Select the Scissors tool from the lower right corner of the Toolbox. Now select the Shading feature from the Mode menu. Make sure the shading Control is in the middle of the Shading Control box, and turn the Dither Control all the way to the left. Now go to the screen and trace around “Lauren’s” left eye, keeping the eye in the center. When you complete the tracing, release the left mouse button and you’ll have the eye as a custom brush. Move to the center of the model’s forehead with this brush and click the left mouse button. The third eye will appear, and the use of Shading will blend it into the forehead very effectively.

CHAPTER 4



CHAPTER 4 Reference

This section will describe in detail each feature of Digi-Paint. To see how these features might be used together, please see the Applications section or the Tutorials for some examples.



General Feature Notes: When the word “activate” is used in connection with one of the items in the Toolbox, you “activate” an item by moving the pointer to the item and pressing the Left mouse button. Menus (containing other features) are selected by using the right mouse button. The buttons in the upper part of the Toolbox (PickColor, Undo, Again, Digi-Paint, CopyColor, Clear, Fill, and RubThrough) show their active status (where applicable) by partially highlighting in white.

Digi-Paint works in two resolution modes: 320x200 and 320x400. Start either version by double-clicking on the appropriate program icon. The features described work identically in either resolution mode. See the Applications section for some uses of the 320x400 mode.

Starting at the left of the Toolbox, here are the features.

Close Gadget

Activate this small button in the uppermost left corner of the Toolbox to remove the Toolbox from the screen. Click on the right mouse button to restore the Toolbox. This button will also make the “File Requester” go away and it replaces it with the Toolbox.

PickColor

Activate this button next to the Close Gadget to pick a color from the screen; this saves you the trouble of trying to figure out exactly what color you want by trying to use the Color Menus. Once the pointer appears, hold down the left mouse button as you move the pointer across the screen. You’ll see the colors change in the color menus. The large rectangle just to the left of the Color Palette (under the left part of the Clear Screen button) shows you the

selected color. Once you release the left mouse button, that selected color will remain, and you can then use any of the brushes to draw in that color. For a shortcut you can also activate the pick function by pressing and holding down the left button over the multiple colored box in the center of the toolbox.

UnDo

Activate this button to undo the last drawing action you made on the screen. You can only UnDo since the last time you clicked the mouse button in the screen area. UnDo will not undo itself. Note: you can “Undo” a “picture load”, but you cannot “undo” your drawing after you have selected “picture load”. “Undo” also works to cancel screen effects.

Again

Activate this button to repeat the last drawing action on the screen. This may not sound very useful until you realize that you can change colors or activate different shading features and use the Again function to place the new colors or shading effects in exactly the same place as your last drawing action. As in UnDO, this feature only works on the action since your last mouse click in the screen area. The “Again” button has another use. When used after you have selected the scissors it will allow your last brush stroke to be used as a brush. For example, you can cut out a perfectly round brush by 1) selecting the “oval” brush 2) clicking and dragging it onto the screen 3) “Undo” to erase what was just painted 4) select scissors 5) select “Again”. The “Again” feature also works with the screen compression effects. If you select “Halve Screen” from the Effects menu, then “Cut” (Scissors) and “Again”, the screen will “Undo” and the compressed area will become your brush.

Dragbar

By pointing at this button and holding down the left mouse button, you can drag the Toolbox up or down the screen. Dragging the Toolbox downward will display more of the picture while still allowing you instant access to your tools. Dragging it up the screen isn’t very useful, since Digi-Paint cannot display the portion of the picture below the Toolbox (due to the nature of Intuition and the HAM mode; see Appendix A).

Front/Back Gadget

These gadgets are in the upper right corner of the Toolbox. They

allow you to bring the Workbench (or any other application) screen up while you still have Digi-Paint active. Click on the left hand box to bring up the Workbench screen; to bring back the Digi-Paint screen, click on the corresponding box in the upper right corner of the Workbench screen.

CopyColor

This button is used to enter colors into the Digi-Paint color palette (located directly underneath this button). Digi-Paint allows you a palette of 16 colors that can be used anywhere on the screen without causing a “fringe” color effect (see Appendix A for a more detailed explanation). To use CopyColor, select the color you want to bring into the 16 Color Palette. Activate the CopyColor button (your curser will have a ‘To’ on it) then click inside the 16 Color Palette to add that color to the palette.

Clear

Activating this button clears the screen to the selected color in the Color Palette. To clear the screen to any specific color that color must be in the 16 color palette.

Fill

Activating Fill means that any closed shapes you draw with the brushes will be filled in with color according to whatever function you’ve selected from the Mode Menu. For instance, if you turn on Fill, select Solid from the Mode Menu, and select a color from the Color Menu, then draw a shape with the one-pixel brush, the shape will be filled in with the color you’ve selected. If you’ve selected Shading from the Shading menu, drawing that same shape will result in a shaded rendition of the color selected. In general, Fill works with all of the Shading functions and most of the brushes and shape tools to produce a variety of effects. However, Fill does not affect custom brushes or the rectangle brush.

RubThrough

This button is not usable unless you have a picture in the spare screen. (See the explanation of Swap in the Picture Menu section further on.) When you do have a picture in the spare screen, use RubThrough to bring portions of the “back” picture to the “front” screen (the one that you’re looking at). Activate RubThrough and then use any of the paint modes, Fill, and any brush. The possible

effects are too numerous to mention here; see the Applications section for possible uses.

Color Palette

Digi-Paint's 16 color Color Palette is shown in the lower left corner of the Toolbox. The 16 colors that you select from the 4096 available may be used anywhere on the screen without causing "Fringing" (explained in detail in Appendix A). The palette color currently selected is highlighted; to select another palette color, point to it and click the left mouse button. Use the CopyColor command to change the colors in the Color Palette. The large rectangle to the immediate right of the Color Palette shows the color currently in use by the brush (which may not be the highlighted Color Palette color, if you've been choosing colors from the Color Menus).

Color Menus

These three large squares in the bottom center of the Toolbox represent portions of the 4096 colors available in Digi-Paint. These menus change dynamically as you move the pointer over them while holding down the left mouse button. As you move toward the color you want, the other menus will show all possible shades of that color. The large rectangle immediately to the left of the Color Menus shows the color you've selected. Use the CopyColor command to put that selected color into the palette, or just use it with any brush or Mode Menu command.

RGB Sliders

These three sliders are located between the Color Menus and the brushes at the bottom of the Toolbox. The sliders, from left to right, represent the red, green, and blue values of the current color on a scale from 0 to 15. These sliders will change dynamically as the selected color changes. You can also move these sliders by pointing to them and holding down the left mouse button while you drag them up or down. This is another way to select a desired color.

Brushes & Tools

These are the different drawing tools available in Digi-Paint. Select a brush by pointing to the brush you want and clicking on the left mouse button. The top two rows of brushes give you a number of different shapes to use for freehand drawing. These different brush shapes give you different edge effects when used with

Shading. Experiment with these brushes using Shading to find the effect you like best. The first two brushes on the left in the bottom row of icons function as the other brushes; but the next three icons are specific tools for drawing shapes. These are the Line, Oval, and Rectangle tools.

Line Tool

The Line tool gives you crosshairs to accurately position your starting point. Once you've selected the straight line tool, click on the screen to position your first endpoint. Then move the pointer to the next endpoint you want for your straight line; you'll see the line "rubber-band" on the screen to your next endpoint, though the line won't be created until you click again. After you've clicked again, you can continue to rubberband lines as long as you want. If you have the Fill activated and you create a completed polygon with your straight lines, the polygon will be filled. Turn off the straight line tool by hitting the right button. Digi-Paint will paint in your line(s).

Oval Tool

The Oval tool is easy to use — just select it and then move the pointer to the position on the screen where you want the center of your oval to be. Click on the center and drag the oval out to the shape you want, and Release the left button to finish the oval.

Rectangle Tool

The last tool is the Rectangle. Select the Rectangle Tool, then place the upper left corner of the pointer where you want one end of the rectangle, then hold down the left mouse button and drag out the rectangle to the size you want, then release the left button.

All of these tools work with the different commands on the Mode Menu, with Fill, and with RubThrough.

Magnify

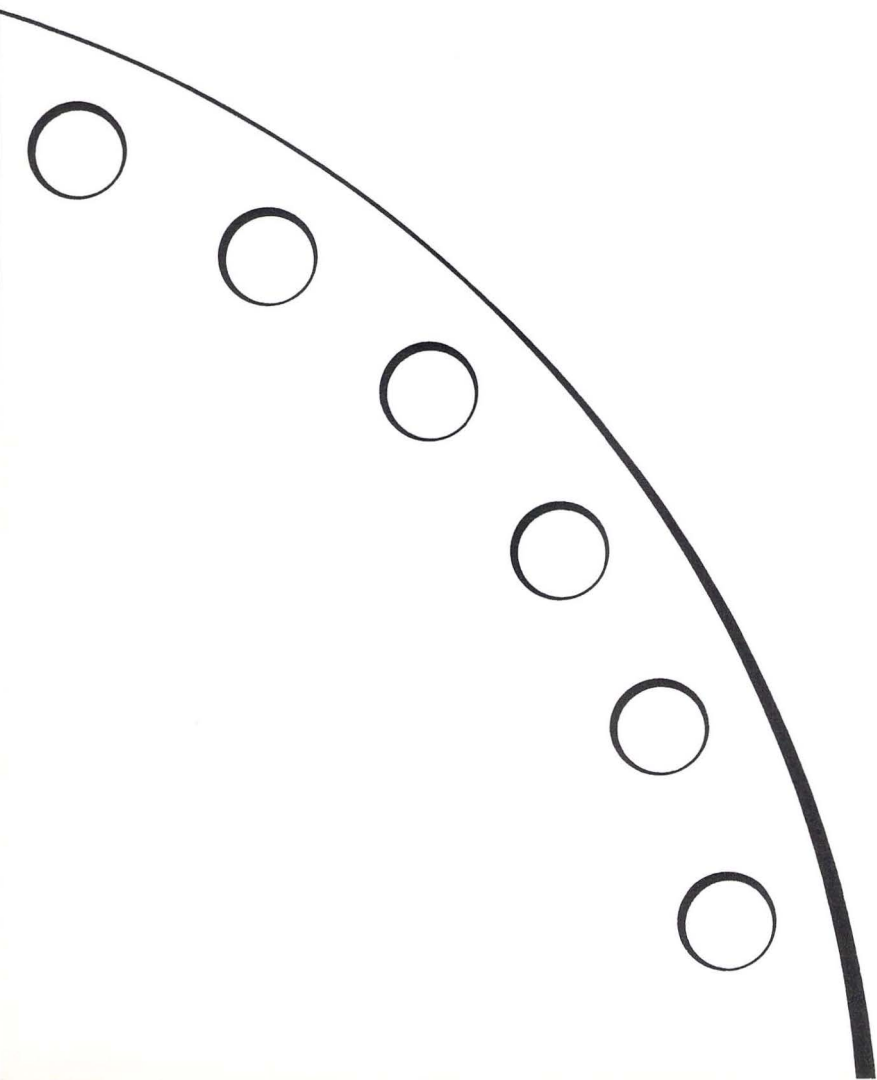
The magnifying glass is located in the lower right corner of the Toolbox. Activate with the left mouse button, bring it to the area on the screen you want to see close up, and click the left mouse button. The area selected will enlarge to fill most of the screen, with a view of the entire area in the upper left hand corner. All tools, except Line, Oval, and Rectangle, work normally in the magnified area. You can scroll around in the magnified area by using the arrow keys

on the keyboard. Return to the normal screen by clicking on the magnifying glass again or by clicking in the upper left corner of the screen.

Scissors

The Scissors are used to create custom brushes, which are cut out of pieces of a picture. This is similar to the Brush tool in DeluxePaint. Click on the scissors to activate them, then draw a line around the area you want on the screen. The area you've defined will become a brush attached to the pointer. The other brushes cannot be used with this custom brush, but all of the features in the mode Menu (and RubThrough) can be used for some rather startling effects. To remove the custom brush, click on another brushes tool.

CHAPTER 5

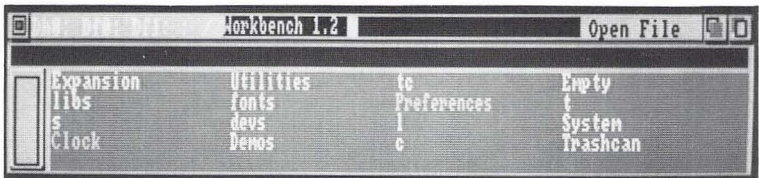


CHAPTER 5 Picture Menu

There are five menus in Digi-Paint containing additional commands and features. These menus appear when you hold down the right mouse button; most of the Toolbox disappears, and the top line of buttons changes into the menu bar. The four menus are titled, from left to right: Picture, Brush, Effects, Mode and Prefs. When you first start Digi-Paint, the default setting is Solid, and that's the title that appears on the lower Menu Bar.

The menus will appear under the title when you move the pointer to the title while holding down the right mouse button. As you move the pointer downward (still holding the right mouse button), commands on the menu will be highlighted. In some cases, submenus will appear, giving you additional choices. Any command (whether on the main menu or a submenu) is selected by moving the pointer to the choice and releasing the mouse button.

Some menu items are “grayed out” and will not highlight when you move the pointer over them. This is because some commands don't become active until other conditions are met. These are detailed in the descriptions of the individual menu commands.



Load: Activating this command brings up the Load Requester window. You can call up picture files that you have saved on disk (or files that someone else created and saved on disk). In the upper left corner of the Load requester is the Close Gadget; clicking here with the left mouse button closes the Load requester and returns you to the Toolbox. Directly to the right of the Close Gadget are three disk drive names — DH0:, DF0:, DF1: — referring to the hard disk drive (if you have one), the internal disk drive of your Amiga, and the external disk drive of your Amiga (or second internal drive, if you have an Amiga 2000), respectively.

Point to the disk drive name where your disk with picture files are located. Click with the left mouse button, and the drive will whirl for a moment and the files and drawers available on the disk will appear in the gray area at the bottom of the Load requester. File drawers appear in white letters; picture files appear in gray letters.

The name of the disk will appear in the black window to the right of the disk drive names. Click on a drawer name with the left mouse button to open the drawer. The drawer name will replace the name of the disk in the black window. Click on the name of a file, and that file name will appear in the black window to the right of the window where the disk or drawer name appears. Comments about the file (if any have been made) will appear in the black window below the disk drive names. If the file you've just selected is the one you want to open, then click on the words Open File with the left mouse button. There will be a brief pause, then the Load Requester will disappear and a small requester will appear asking you to "choose palette for display". Click on the From File button if you want to use the palette taken from the file; click on Existing to use the palette that currently exists in your Digi-Paint screen (see the section on Color Palette for more information).

The picture will load in from disk, causing the Toolbox to disappear. If you want to bring back the Toolbox, just click the right mouse button. (You can close the Toolbox by clicking with the left button on the tiny box in the upper left corner of the Toolbox).

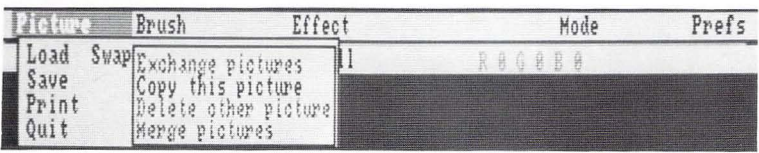
Other features of the Load Requester: If you click on the "/" mark that's between the disk drive names and the window where the disk name appears, you will move from a directory of the drawer that you're in back to a directory of the whole disk (or the next "higher" drawer, if you're using nested drawers). If there are more file names than the area allotted can hold, the gray bar to the left of those names is used to scroll the window showing the file names. Point to the gray bar and hold down the left mouse button, then drag it up or down to scroll the file names. (Nothing will happen unless there are more file names than the window can show). If you want to make comments attached to a particular file, select the file (so it's name appears in the file name window, as described previously), put the pointer in the file comment window, and click the left button. Now type your comments. When you're done, press Return and the comments will be stored with the file. Note: You can use this feature to add comments to files already on a disk, without having to load the file. These comments also appear in the "Workbench icon info" screen and when you use the list command from the CLI.

Save: The Save command is used to store the work you've done in a file on the disk, so that your work may be called up again by Digi-Paint, or called up from another program such as Digi-View.

The Save Requester is identical to the Load requester in it's features, except that the words Open File have been replaced with Save File. Type in a new name for the file you want in the File Name Window by first clicking in that window with the left mouse button, then typing the name you want. Then press Return to save the file, or point to the Save File and press the left mouse button. If your disk is full and has no more room for files, Digi-Paint will warn about this when you try to save the file. It is generally a good idea to have some data disks formatted and ready just in case you run out of room on your disk. If you wish to save a comment about your file; click in the comment box, type your comment, press return.

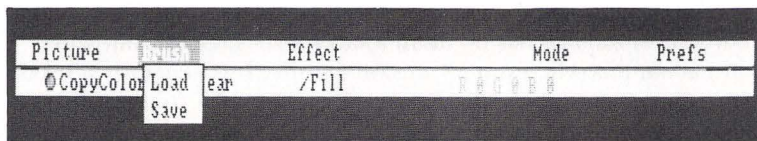
Print: To print the picture that's on your Digi-Paint screen, select this menu item from the Picture menu. Make sure your printer is already connected before using this feature.

Quit: Select this menu item to exit Digi-Paint and return to the Workbench. **CAUTION:** If you haven't saved the picture you've been working on, you'll lose that picture when you Quit.



Swap: This menu item controls the spare screen that Digi-Paint makes available to you. In essence, you can have two pictures present in Digi-Paint at the same time, one in "front" and one in "back". The Swap submenu gives you the following commands: Exchange Pictures, Copy This Picture, Delete Other Picture, and Merge Pictures. Exchange Pictures will switch the front and back pictures. Copy This Picture is the only feature active when you start up Digi-Paint. Use this feature to copy whatever is in the current screen of Digi-Paint to the spare screen. For instance, load the "Lady" picture into Digi-Paint, then select Copy This Picture. The picture will be copied to the spare screen. When this happens, you'll notice that the RubThrough button will become visible (see RubThrough). Now use Clear to clear the front screen to the color selected. Go back to the Swap menu and use the Exchange Pictures command to switch the front and back pictures. Delete Other

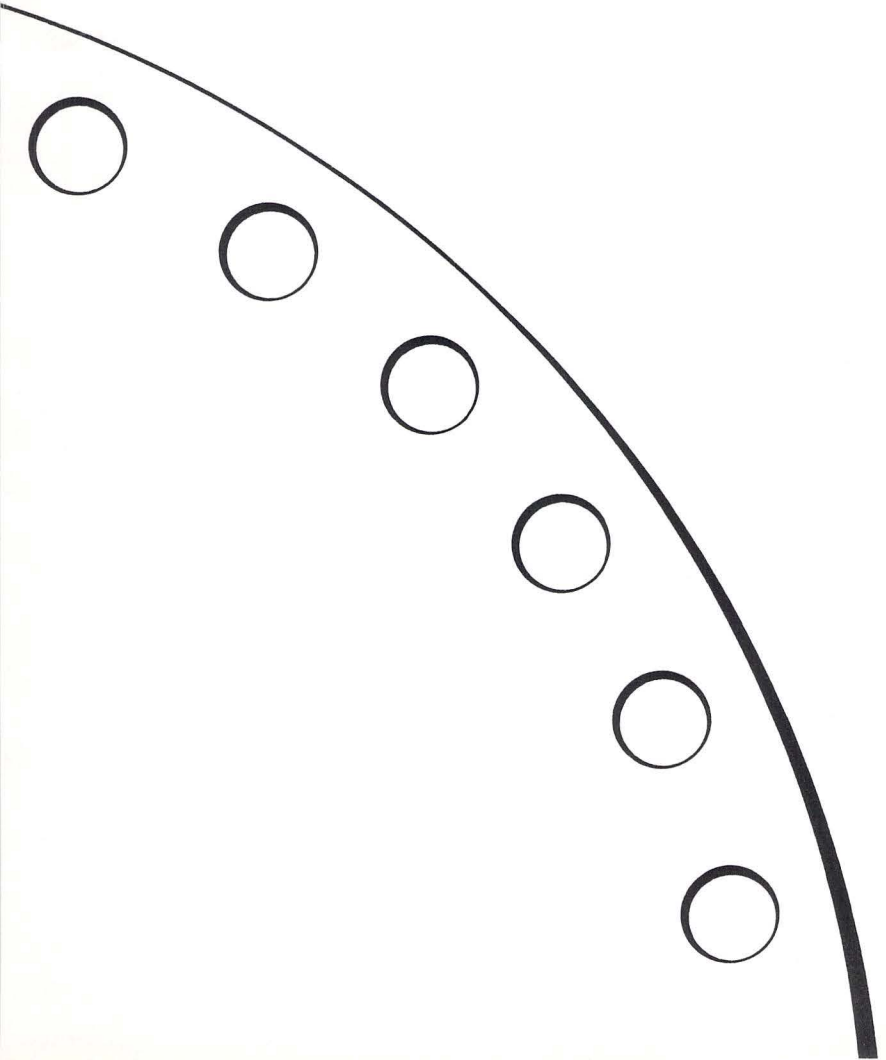
Picture will remove the picture stored in the spare screen, while Merge Pictures will merge the front and back pictures using the operation chosen from the Mode Menu. With merge, the whole back picture is the “paint” (see the Mode Menu section for a more detailed explanation).



Brush Menu

This menu allows you to load or save the custom brushes you’ve created using the Scissors tool in Digi-Paint or from a 32 color IFF programs (like DeluxePaint). Load and Save Requesters here work exactly the same as Load and Save in the Picture Menu.

CHAPTER 6



CHAPTER 6 Effects



Double Screen Size: This command allows you to double the size of the picture on screen either horizontally, vertically, or in both directions, depending on which submenu item you choose. The pixels will be doubled beginning in the upper left corner and working outward from there. We recommend some experimentation to make sure you know what you'll get with this feature.

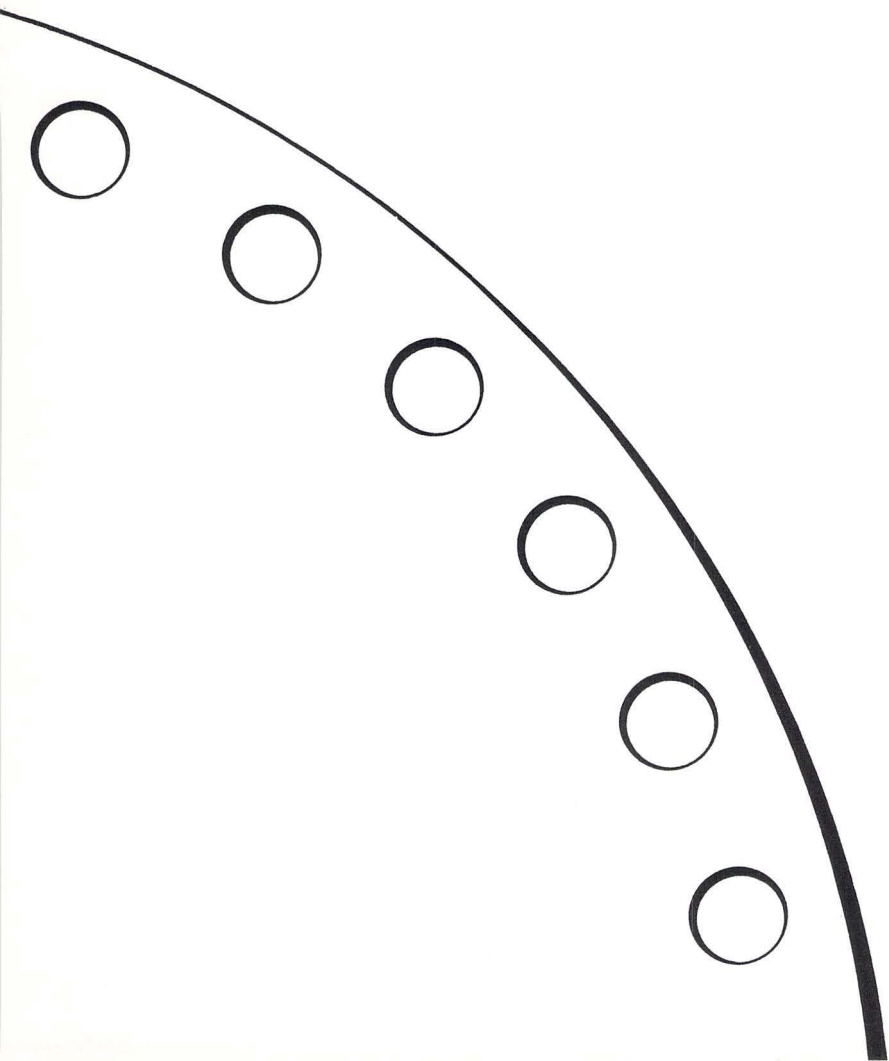
Halve Screen Size: This command allows you to halve the size of the picture onscreen either horizontally, vertically, or in both directions, depending on which submenu item you choose. The pixels will be halved beginning in the upper left corner and working outwards from there. We recommend some experimentation to make sure you know what you'll get with this feature.

Soften This command "softens" the picture on screen by copying the screen in memory, shifting the screen one pixel, overlay the original and the copy, then averaging each individual red, green, and blue value between the old and new pixels. The effect is to make the screen look slightly smeared, or a soft-focus effect. Soften can be used horizontally or vertically, but if you intend to do both, you should do the vertical effect first for best results.

Mirror Flip Screen: This command flips the screen either horizontally or vertically, depending on which submenu item you choose.

Switch Half Screen: This command splits the screen in the middle, either vertically or horizontally, then switches the halves. To reverse this operation, choose the same command again.

CHAPTER 7



CHAPTER 7 Mode Menu

Picture	Brush	Effect	Mode	Prefs	
☒ CopyColor	☒ Clear	/Fill	/Solid	Minimum	Xor
			Blend	Maximum	And
			Tint	Add	Or
			Light_Tint	Subtract	Shading

This menu consists of mode selections. Digi-Paint Modes can be thought of as different “paint types”. Modes effect the way your brushstrokes are painted onscreen, and the merging of pictures. More importantly, these commands can be used to provide some subtle shading effects on pictures, tinting or blending colors to take full advantage of the 4096 colors at your disposal.

When using the Mode Menu features, the brush you are using is referred to as the “paint” with the following exception: with RubThrough on, the “Swap Screen” is the paint and your custom brush acts as a mask (or stencil).

The best way to grasp how each of these Mode Menu features works is to experiment with them on a picture. You’ll soon gain an intuitive knowledge of how these features work, and how to use them to get the desired effect in your artwork.

Solid: This is the default command in this menu. When solid is checked, any brush will draw in the currently selected color (shown in the large retangle next to the Color Palette).

Blend: This averages the red, green, and blue values of the pixels in the paint with the pixels in the picture. For instance, Red 10 averaged with Red 4 would become Red 7. (See Appendix A for a discussion of red, green, and blue in HAM mode.) In practical use, the color you have selected to use your brush ends up as a different shade, becoming “translucent” if you will, like a sheet of sheer cloth.

Tint: This does an average of the RGB values similar to Blend, except that the average is weighted toward the screen: 1 part paint, 3 parts screen. The effect is to get a much lighter value of the brush color applied to the area you paint on.

Light Tint: This mode moves each RGB value one notch toward the paint color. Thus, a pixel with an RGB value of 4, 6, 8 used with

Tint Min, a brush and an RGB value of 7, 13, 9 would become 5, 7, 9. This is the lightest possible additional shading.

Minimum: This mode picks the lower of each RGB value between the paint and the screen. This results in some interesting effects. The result is not just darker; the colors may change dramatically. To predict how it's going to affect the picture, determine the RGB values of the colors in the area by using PickColor, run the pointer of those colors, and watch the RGB sliders at the bottom of the Toolbox. Compare those RGB values to the value of the brush color you're going to use, and you can tell what the effect will be on the picture. It may be necessary to try the effect you want and if it's not right, use UnDo to remove the paint you just laid down. Then you can use the Again command after you've changed your Mode Menu selection to try another command on exactly the same spot in the picture.

Maximum: This command picks the maximum of each RGB value between the paint and the screen. As with the Minimum mode, the results are not always intuitive until you have experimented with this command. Normally, the affected area becomes lighter, but sometimes the color hues will change dramatically.

Add: This mode adds the RGB values of the paint and the screen together, with the maximum possible value being 15. In many cases, the result of this command will be white.

Subtract: This mode subtracts the RGB value of the paint from the screen, with a minimum value of 0. In many cases, the result of this operation will be black.

Xor: This function is perhaps the strangest of all of the shading functions. The title (pronounced Ex-or) refers to a function in mathematical logic called an "exclusive-or" operation. This command operates on the RGB values as binary numbers; that is, Xor converts the base 10 RGB values into binary, then compares the binary values of the paint and the screen pixels. Those of you familiar with binary logic should be able to take it from there. The rest of use need to experiment to determine exactly what Xor does. For the most part, Xor will seem to reverse the colors of the area you act upon; this is especially the case if you use a white brush (RGB values of 15). NOTE: Painting with White (RGB of 15) will

give you a “negative” image.

And: This is another binary operation that compares the RGB numbers of the paint to the screen. In this case, the result of the comparison is a 1 only if both of the numbers are ones. The effect of And is to push the affected colors in the direction of the paint you’re using. And is also useful to remove other colors. For instance, if you And with Red 15 (Green & Blue at 0), the result will be the pure red separation of the picture. NOTE: This operation can be used to make RGB color separations of the image for printing applications. Yellow, cyan, and magenta separations are also possible.

Or: The final logical function used in Digi-Paint, if either or both of the binary digits are 1, the result is a one. The effect is usually to add color or lighten a picture, but this will vary depending on the RGB values of your paint.

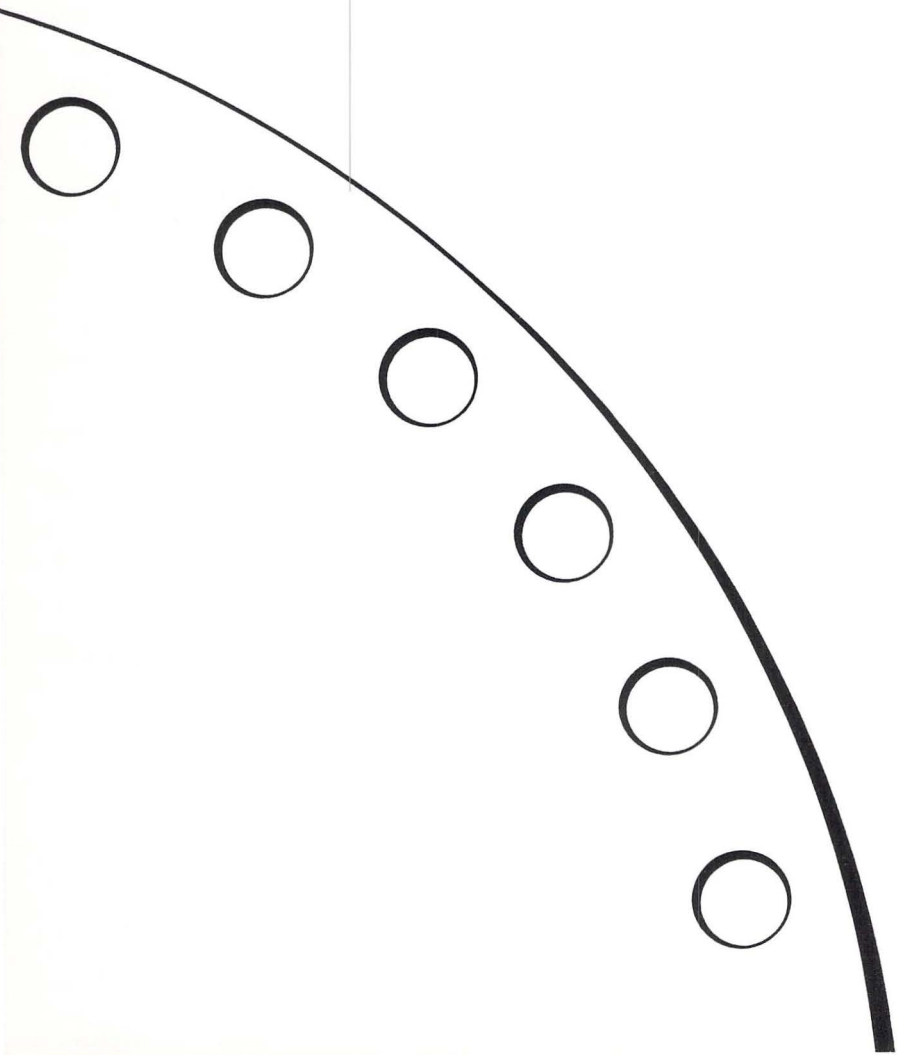
Shading: Selecting this item from the Mode menu allows you to create shaded objects. Different tones of the selected color are gradually diffused out from the center of the object that you’ve selected. This feature works with any of the brushes (including custom brushes), the shape tools (Line, Oval, and Rectangle), and the Fill feature. Once you’ve selected Shading, you’ll see the Dither control (directly under the Digi-Paint button) activate, as well as the Shading Control (directly to the right of Dither), and the Directional Arrows (directly to the right of the Shading Control).

The Dither Control regulates how much “dithering” (mixing of different colored pixels) occurs. Move the Dither Control by pointing to it and holding down the left mouse button, then drag the slider in the desired direction. With Dither Control all the way to the left, the transitions between shades will be abrupt, creating a “banded” effect. With Dither Control all the way to the right, the pixels at the edges of the color transitions will be mixed randomly to create a softer transition.

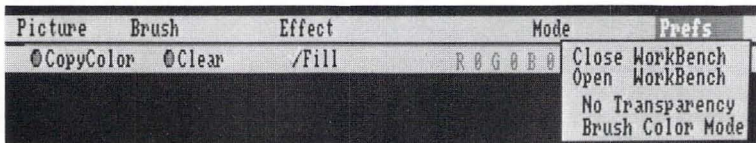
The Shading Control determines where the center of the shading will be. Move the Shading Control by pointing to the small square in the middle of the box, holding down the left mouse button, then dragging the box in the desired direction. The shading control can be moved both vertically and horizontally at the same time. If you want a purely horizontal or vertical effect in your shading, use the Directional Arrows to change the Shading Control. Point at the left

Directional Arrow and click the left mouse button to turn it off, thus making the Shading Control work only vertically. The other Directional Arrow makes the Shading Control horizontal only. Turning off both Directional Arrows gives an interesting effect: “dithered paint”. When you paint with a brush (especially using Fill), the paint will have a mixture of different shaded pixels throughout. This is especially useful when painting in digitized pictures, to avoid that rather jolting effect of pure colors in a digitized picture where pure colors are rare.

CHAPTER 8



CHAPTER 8 Preferences



This Menu items allows you to change certain things about the way the Digi-Paint works with custom brushes, and the way it interacts with the Workbench environment.

Close/Open Workbench: When you select the Close Workbench menu item, Digi-Paint simply requests that the system close the Workbench. Closing the Workbench will allow Digi-Paint at least another 32K (or 64K in the Interlace mode) of “chip” RAM. This extra memory may help Digi-Paint access more features like a swap screen or cut and paste when you are running low on available RAM. To reopen the Workbench screen simply select Open Workbench. NOTE: This menu item will not work when you run Digi-Paint from CLI.

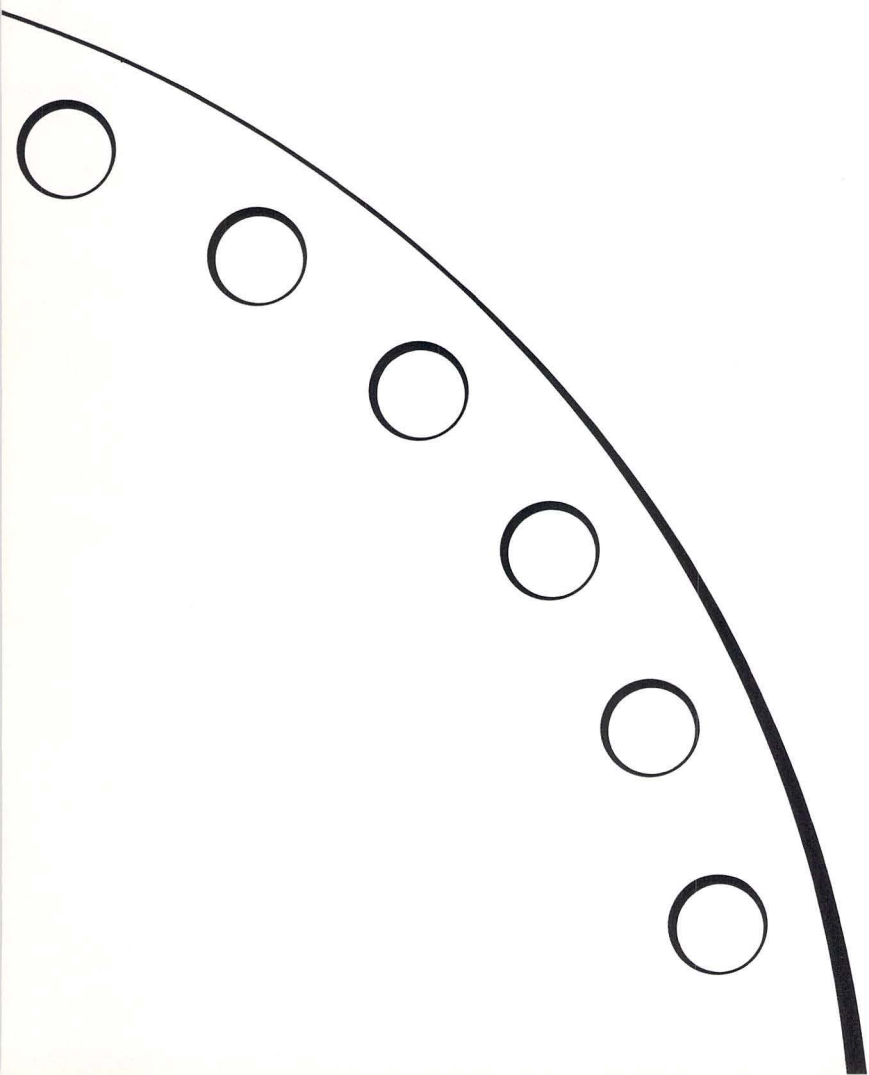
No Transparency: By default, Digi-Paint treats black (RGB-0,0,0) and the first (upper left hand corner) palette box as transparent when you use a custom brush or RubThrough. If you don’t want the black or the first palette color to appear transparent in these modes then select No Transparency.

Brush Color Mode: This item is only applicable to the custom brush images. This feature allows your custom brush to be pasted as a solid color (or using any of the 12 Mode Menu features), ignoring the colors in the brush image, using it for a shape only. This feature is useful for creating a “Drop Shadow” for your selected brush. One way to do this with this feature is:

1. Using a light color background, select a custom brush image.
2. Select the “Brush Color Mode”.
3. Select “Subtract” from the “Mode Menu”.
4. Pick a dark grey color (red-2, green-2, blue-2).
5. Position your brush where you want your shadow and paste it.
6. Select “Solid” from the mode menu.
7. Disable the “Brush Color Mode” by selecting it again.
8. Position your brush over the shadow (slightly up and to the left) and paste.

This is just one of many effects possible using the Brush Color Mode with the various Mode Menu features. We recommend experimentation to familiarize yourself with all the possibilities.

APPENDIX



Appendix A: HAM Mode and DigiPaint

The Hold-And-Modify (HAM) display mode on the Amiga uses six bit planes to display images. This means that each pixel (picture element — one dot on the screen) uses 6 bits to determine its color. If the first 2 bits are “00”, the remaining 4 bits (giving a value of 0 to 15 in binary) are used to look up the pixel’s color in the color table. This gives you 16 values from the possible 4096 colors available, which is why Digi-Paint has 16 colors in the Color Palette. Each color has 4 bits of red, green, and blue information; thus, each color has a Red value from 0 to 15, a Green value from 0 to 15, and a Blue value from 0 to 15.

If the first two bits of a given pixel are 01, the pixel has the same color as the pixel to its immediate left, except that the last four bits can be used to replace the red value of that pixel. If the first two bits are “10”, the last four bits replace the green value, and if the first two bits are “11”, the last four bits replace the blue value.

The effect of all this is that you can display all 4096 colors on the screen at once, though you can’t go from black (red 0, green 0, blue 0) to white (red 14, green 15, blue 15) in one pixel; it takes three pixels to make that transition, since you can only modify one of the RGB values for each pixel. The transition would take four pixels on the screen. The first pixel is RGB 0-0-0; the second pixel is RGB 15-0-0; the third pixel is RGB 15-15-0; the fourth pixel is RGB 15-15-15 (white). HOWEVER, the ability of Digi-paint to use the 16 color Color Palette means that for 16 of the colors you choose, that color can be immediately substituted anywhere on the screen without the transition just described. This technique is what gives Digi-View 2.0 its exceptionally sharp HAM images, and this feature also makes Digi-Paint a very powerful tool.

Appendix B: Applications

Digi-Paint is a very powerful tool for producing and manipulating images. With so many possible features and combinations of features, it’s hard to grasp all of the things that you can do with Digi-Paint. We don’t pretend to know all of the answers. Many of Digi-paint’s most productive techniques and applications will be discovered by enterprising users like yourself. We hope that you take the time to write to us at NewTek, Inc. to share the expertise you’ve gained. For now, in this section we’ll offer up some suggestions about using Digi-Paint.



Digi-Paint is the perfect companion to NewTek's Digi-View video digitizer. (If you don't already own Digi-View, it's a combination of hardware and software of your Amiga that allows you to "digitize" objects or pictures using a video camera, thus bringing the images into your Amiga.) Digi-Paint reads in any Digi-View picture, and can be used to touch up, edit or combine such pictures. The RubThrough mode is particularly useful to merge two Digi-View pictures using the special features in the Mode menu. Combine a digitized picture of yourself or your friends with digitized pictures of the rich and famous. See what you'd look like with different hair color or even a different hair style. Or, for more commercial applications, you can digitize products and alter their appearance to help make design decisions. Digi-Paint now gives you the capability to edit the lifelike images you get from Digi-View, which lets you get more out of your Digi-View.

Digi-Paint can also be used to read any IFF (ILBM Type) image into HAM mode. Take images or brushes you've created with DeluxePaint and bring them into Digi-View to add enhanced shading that isn't possible with only 32 colors to use. Bring in several IFF images with different 32 color palettes and display them all at the same time. Digi-Paint also excels at bringing in IFF images from any resolution mode and remapping them into either 320x200 or 320x400. A 320x400 or 640x400 image brought into 320x200 will lose the bottom half of the picture, but the 640 width

